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University of Wisconsin Primate Laboratory
Madison, Wisconsin

Contract No.: DA-CML-18-108-G-34

Second Annual Progress Report
Covering the period October 1961 - October 1962

MEASUREMENT OF DETRIMENTAL DRUG EFFECTS
ON COMPLEX BEHAVIOR IN ANIMALS

Prepared by
V. J. Polidora and H. F. Harlow

1 October 1962

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AD Accession No. University of Wisconsin Primate Laboratory
Madison, Wisconsin

MEASUREMENT OF DETRIMENTAL DRUG EFFECTS 1. Animal Psychopharmacology.

V. J. Polidora and H. F. Harlow

Report No. 2, 1 Oct. 1962, 2 pages
Grant No.: DA-CML-18-108-G-34

Each of the three research programs (the Sequential Response Test, the Vigilance Test, and the Wisconsin Automatic Test Apparatus, WATA) have been completely instrumented, and psychopharmacological experimentation on several incapacitating agents has been initiated during this year.

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ABSTRACT

In pursuit of the general goals of this grant, the development and validation of behavioral testing procedures to detect and quantify the detrimental behavioral effects of incapacitating agents on animals, the instrumentation of the three research programs initiated during the first grant year were this year completed. Experiments of mainly psychological import were conducted on the Wisconsin Automatic Test Apparatus (WATA), while psychopharmacological research programs were initiated within the framework of the Vigilance Test and the Sequential Response Test.

During this, the second year of the grant, the instrumentation of the three research projects were completed, and research programs were initiated on each. (Reference, First Annual Progress Report, October 1961).

I. The WATA (Wisconsin Automatic Test Apparatus) was completed in November, 1961, and the first experiment, intended both to establish the reliability of the instrument and study two important questions of discrimination learning, began at that time. Sixteen monkeys were tested for sixty-four trials each day, five days per week, and at the completion of the experiment in May, 1962, (28 consecutive weeks) 150,000 trials had been run. During that time, exactly twenty apparatus breakdowns occurred, each requiring less than five minutes to repair. It is felt that this favorable maintenance history established the reliability of the entire system, and demonstrated the feasibility of a punched card mode of programming and recording primate discrimination learning situations.

The results of the experiment were of interest and value in the study of learning, and it is planned that they will be presented to the 1963 convention of the Midwestern Psychological Association, and published in the Journal of Comparative and Physiological Psychology. After modifying the stimulus programming and display system so as to be adaptable to the next series of experiments, the second study was started.

II. The sequential response test for the rat was also completed at the end of 1961, and additional experiments were conducted to investigate the detrimental behavioral effects of JB-329, JB-319, JB-340, JB-336, LSD-25, atropine, JF-11, chlorpromazine, and the "antidotal" effects of THA in this test.

Systematic dose-response, and time-response functions were obtained for each compound known to have detrimental behavioral effects in man, and the test showed that the magnitude of the effect was inversely related to the complexity of the sequence.

The sequential response method, and data from one hallucinogenic agent, JB-329, together with data from saline, barbiturate, and prototype drug control conditions, will appear in the April, 1963 issue of the Journal of the Experimental Analysis of Behavior. Reprints will be submitted when available.

Instrumentation has also been completed on the monkey sequential response test, and it is expected that psychopharmacological experimentation will begin early in the coming year.

III. Finally, the vigilance test has been completed, and one series of experiments was performed, again with the above hallucinogenic and control compounds. These data were reported to the 1962 meeting of the Psychonomic Society. When additional relevant data have been gathered, it is planned that the method and data will be published in the Journal of Comparative and Physiological Psychology.

In addition, provision has been made for studying human vigilance behavior by this method. University students and/or ROTC volunteers will be used as subjects, and attempts will be made to elucidate several psychologically important dimensions of vigilance behavior which have been previously insufficiently studied due to technical difficulties inherent in other methods. With the vigilance method as employed here, however, the parameters of signal complexity and noise density will now be subject to direct experimentation. It is expected that this program will begin toward the end of the coming year.